

**ABSTRACT OF THE DISCLOSURE**

Devices and methods for equalizing the gain of an optical amplifier are described. For devices including harmonic filters that are controllable by amplitude control voltages and phase control voltages, techniques for controlling the amplitude control voltages and phase control voltages are presented. Additionally, device architectures are described by which an incoming optical signal is equalized to compensate for uneven gain in prior amplifiers or other optical components, and in which the incoming optical signal is received at a beam displacer and separated into orthogonal component beams, wherein the beams are counter-propagated through the equalizer in opposite directions through the same spatial path so as to minimize or eliminate the effects spatially dependent imperfections in the equalizer.

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